EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

Institute for Reference Materials and Measurements

Dismantling of obsolete installations and glove boxes

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European Commission
Directorate-General Joint Research Centre
Institute for Reference Materials and Measurements

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1. Introduction

At the IRMM, a campaign was started to remove some obsolete installations. There were various reasons for their removal. Some large installations did not meet modern safety standards, other installations were worn out and expected to cause a radioactive contamination risk in the future.

The project as described in this paper can be divided into two main parts:

Dismantling campaign for obsolete installations: dismantling of obsolete installations in the controlled area where most of the material can be shipped as "normal" waste

- Room 226, old weighing box
- Roller in room 529
- Large oven in room 533

Dismantling campaign of glove boxes: contaminated glove boxes where all the contaminated parts had to be separated and packed in 200 l drums and treated as nuclear waste.

- Glove-box H 48 in room 521
- Glove-box H2 in room 531
- Glove-box H1 in room 527
- Glove boxes H 101, H 102 and H 73, room 246
- Glove-box H 21 in room 523
- Glove-box H 6 in room 529

The campaign was started in June 2004 with the checking by wipe tests in the installations and glove boxes. These wipes were measured and the contamination levels of all the sides of the glove boxes were calculated. A pick-up factor of 10% was taken into account.

Room	Glove box	Isotopes	Contamination level in Bq / cm² Top	Bottom	L – R side	Front side	Back side
529	H6	Pu, U, ^{237}Np	900	200	60	900	100
527	H1	^{239}Pu, ^{237}Np	20	33	10	20	10
521	H48	^{241}Am, ^{239}Pu	3	22	6	3	2
529	H2	^{239}Pu	10	30	14	16	10
523	H21	^{239}Pu	100	1000	75	30	100
246	H101	$^{239, 242}$Pu	0,6	1	0,6 – 0,3	0,5	0,6
	H102	$^{239, 242}$Pu	0,6	3,5	0,3 – 0,6	0,3	0,6
	H73	$^{239, 242}$Pu	5	90	5 -12,5	4	5

After studying these results and the difficulties of the dismantling operations, a priority list was made in agreement with the lab responsible and group leader.

Priority	Room	Description	Isotopes	Contamination level
1	226	Glove box previously used for weighing	^{235}U, ^{239}Pu	< 1 Bq α / cm²
2	529	Large roller	U	< 1 Bq α / cm²
3	529	Large oven	U	< 1 Bq α / cm²
4	529	Glove-box H2	^{239}Pu	from 10 Bq α / cm² to 30 Bq α / cm²
5	529	Glove box H6	Pu, U, ^{237}Np	from 60 Bq α / cm² to 900 Bq α / cm²
6	527	Glove-box H1	^{239}Pu , ^{237}Np	from 10 Bq α / cm² to 33 Bq α / cm²
7	521	Glove-box H48	^{241}Am , ^{239}Pu	from 2 Bq α / cm² to 22 Bq α / cm²
8	523	Glove-box H21, balance	^{239}Pu	from 30 Bq α / cm² to 1000 Bq α / cm²

A call for tender was published and the contract was awarded to Tecnubel NV.
The full description of the technical and practical aspects of this work, can be found in report (ref. 60.216/030/M/KL/PCR) by Pieter Cretskens of Tecnubel. This report can be consulted in the office of Mr. Kockerols, Sector Head, RS.
Excerpts of this report have been translated and used in this report.

During the work, the re-arranging of priorities of the contaminated glove boxes was left to the judgement of the contractor, after approval by the IRMM.

During the campaign, the 3 glove boxes in room 246 were added to the dismantling project. They were dismantled just before the use of the "glove tent"

The work was carried out in following priority order:

1 – 2 – 3 – 7 – 4 – 6 – room 246 – 5 – 8

A kick-off meeting took place on Tuesday 26 April 2005 with all the staff involved.

Work was completed on Friday 08 July 2005.

2. Dismantling campaign for obsolete installations

A demarcated area was set up around the installation to be dismantled in order to prevent spreading of contamination from dust and dirt. This was only possible for the "minor" contaminated installations. Many of the installations contained oil and grease.

General way of working

- All parts were removed piece by piece, degreased and cleaned. After drying, absorbant paper towels were treated as combustible nuclear waste.
- Checks for alpha and beta contamination with direct measurement.
- Wipe tests were taken over 100% of the surfaces and registered.
- Wipe tests measured in the R.S. laboratory.
- Where contamination was detected, the object was decontaminated, measured again and new wipe tests were taken.
- When all the results were negative ($\alpha < 0{,}04$ Bq/cm² and $\beta < 0{,}4$ Bq/cm²) these parts were immediately removed from the controlled area to a buffer storage area.
- A second check was made by the Authorized Control Body, AV Controlatom.

2. a Room 226, old weighing box

History

This is a large glove box made up of 3 units and used for different types of weighing: powders, liquids, solids.
In the early 80's the glove box was decontaminated by the SCK and never used again. Because of its size it was left in the lab.
The removable contamination is almost zero.
Contamination level < 1 Bq α / cm².

This box was used to demonstrate metal cutting with an electric saw.
For fire safety reasons, grinding, abrasive cutting or use of heat or spark generating devices were not allowed.

Preparatory work

- Two old balances and plates were removed and shipped as nuclear waste.

Work description

- Removal of all the outside filters, valves, electric connections…to check for contamination in room 531.
- A tent with SAS (airlock) was erected around the box.
- Work started with cutting the upper side, working downwards.
- The front plexi-glass windows were cut in pieces, packed and moved to room 531 for contamination checks and possible decontamination. All the walls were cut into smaller pieces to be decontaminated or shipped as RA waste.

2. b Roller in room 529

History

This roller was used to make foils of U alloys.
Because of the high cost to make the roller safe according Belgian Law for Machinery, it was decided to dismantle the machine.
Contamination level: < 1 Bq α / cm².

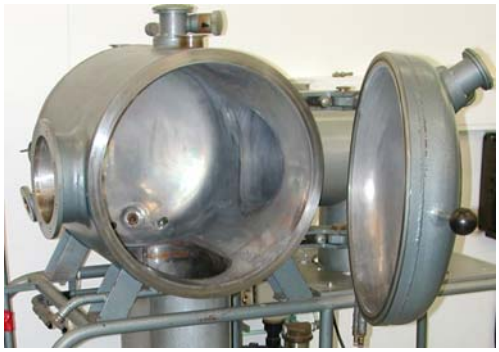
Preparatory work

- Removal of the content: tools, internal lights, Kleenex,…
- Removal of all the oil in various places.
- Removal of outside tubes, cables, plates.

Work description

- No tent, only PE foil and demarcation leading to fume hood.
- All the side panels were removed and transported to the fume hood for decontamination. Tests showed that no contamination was left.
- All the checked items were stored on the table next to the fume hood. After confirmation of no contamination, they were immediately shipped outside the controlled area to the buffer storage.

2. c Large oven in room 533



History

This oven was used to make U alloys.

Preparatory work

- Vacuum pumps dismantled and checked.
- Water cooling system dismantled and checked.
- Oven completely emptied and checked.

Work description

- No tent, only PE foil and demarcation leading to fume hood.
- Same procedure was followed as for the rolling device.

2. d Conclusion decommissioning campaign

All the checked materials free of contamination were gathered in the basement of the MS building on 10 pallets as a buffer storage.
The Authorized Control Body, AV Controlatom was invited to re-check all these materials for final approval and official clearance. No contamination was found.
An official report will be made for the archive.

The mix of materials was sorted and shipped as classic waste.

According to IRMM procedures, the registration form F-0040 for "Clearance controlled areas - Register cleared materials" was completed in order to allow the yearly declaration of released materials to the Belgian Authorities.

Smaller pieces were weighed on the RS balance (max. 100 kg). Heavier objects were gathered and weighed by the Infrastructure and Site Management Unit.

- A total weight of **4.359 kg** of materials was decommissioned
- Metallic and industrial waste: **4.167 kg**
- As hazardous waste: **192 kg**
- Secondary R.A. A11 waste: **21 kg**
- Total number wipe tests : **2 505**
- Total number contaminated wipe tests: **118**
- Total contamination removed: **8,06 kBq**
- Max. values on wipe tests: 848 Bq for α and 97,4 Bq for β

3. Dismantling campaign of glove boxes

The dismantling campaign was carried out in two types of tents depending on the contamination inside the glove boxes. The most common glove boxes were dismantled in a tent constructed with hard surfaced polycarbonate plates. It was erected inside the lab, around the glove boxes using the standard technique with SAS, independent breathing apparatus, hand and foot monitor at the exit of the tent.
For glove boxes with higher contamination, the same principle was used but with a second glove box tent inside to prevent the spreading of contamination.
When dismantling, the operators wore protective clothing with outside air connection. This offered better visibility and because of the ventilation it was more comfortable.

General way of working

- The support that carries the glove box was taped up for removal afterwards. All outside parts were removed piece by piece and checked for contamination.
- The box was dismantled starting from the top, down. All parts were cut into pieces, packed in plastic and separated in different barrels.
- The RS responsible kept a detailed record of the materials in different barrels.
- After the work, the tent was decontaminated and checked for re-use.
- When the tent was completely empty it was checked for alpha and beta contamination with direct measurement.
- Wipe tests were taken over 100% off the surfaces and registered.
- Wipe tests were measured in the R.S. laboratory.
- Where contamination was detected, the spot was decontaminated, measured again and new wipe tests were taken.
- Where all the results proved negative, the tent could be dismantled and rebuilt.
- The floor of the lab was checked for contamination with the floor monitor and wipe tests. If these results were all proved negative, the lab was cleared.

3. a Glove-box H 48 in room 521

History

This glove box was mainly used for repacking and heavy duty punching.
It has a very wide opening for bagging out giving the possibility for handling large targets.
Isotopes were ^{241}Am, ^{239}Pu.
Contamination level: from 2 to 22 Bq / cm².

Preparatory work

- Punches were dismantled, bagged out and stored.
- Waste bagged out.
- Fixation of contamination with adhesive spray. Some years ago, several types of fixation sprays (varnish, plastic spray, etc.) were tested and the adhesive spray with contact glue gave no chemical reactions. The advantage being that untreated spots are easier to detect.

Work description

- A tent was erected around the glove box.
- The support frame that carries the glove box, was taped up for removal afterwards: no RA waste.
- The box was dismantled starting from the top, down. All parts were cut in pieces and separated.
- After the work, the tent was decontaminated and checked for re-use.

3. b Glove-box H2 in room 531

History

Glove box H 2 contained a small manual roller for ^{239}Pu foils.
Contamination inside from 10 Bq α / cm² to 30 Bq α / cm².

Preparatory work

- Roller was dismantled and stored as RA waste. The waste was marked as “denuclearisation waste” in separate barrels.
- Box completely emptied.
- Fixation of contamination with adhesive spray.

Work description

- This glove box was disconnected and transferred to room 521 for dismantling in the same tent as H48.

3.c Glove-box H1 in room 527

History

Glove box H1 was used to make ^{239}Pu and ^{237}Np alloys with levitation melting.
Contamination level for α from 10 Bq / cm² to 33 Bq/cm²

- Two pumps outside.
- Inside oven, glass vacuum installation, tools.

Preparatory work

- Dismantling of one pump.
- Bagging out all the tools and materials.
- Making of two large bags to bag out the large oven and glass clock through the SAS.
- Fixation of the contamination.

Work description

- A tent was erected around the glove box and pumps removed before dismantling.

3. d Glove boxes H 101, H 102 and H 73, room 246

History

These glove boxes were used for preparing synthetic mixtures and connected as a "train".
Isotopes: ^{239}Pu and ^{242}Pu.
Contamination level: from 0,3 to 90 Bq / cm².

Preparatory work

- Balance was dismantled and sealed out.
- Waste sealed out.
- Fixation of contamination.

Work description

A tent was erected around the glove boxes. Work started with H101 and H 102 because of lower contamination level.

3. e Glove-box H 21 in room 523

History

This glove box was used for weighing "higher" activities and ^{239}Pu powders.
This was the most contaminated glove box to be dismantled.
Contamination level: from 30 Bq α / cm² to
1000 Bq α / cm².

Preparatory work

- Waste sealed out.
- Concrete support under box removed.

Work description

- A "tailor" made glove box with protective tent was erected around the glove box.

3. f Glove-box H 6 in room 529

History

This glove box was used for compressing "higher" activities Pu, U, ^{237}Np powders. It was in very bad condition and had to be handled with care.
This was the second most contaminated glove box to be dismantled.
Contamination level: from 60 Bq/cm² to **900** Bq/cm² for α.

Preparatory work

- Waste bagged out.
- Fixation of contamination.

Work description

Was dismantled in glove box tent in room 523.

The use of this "tailor" made glove box tent was a first in Belgium. No unexpected problems occurred thus being a very good experience for the IRMM and the contractor. A detailed description can be found in the report (ref.60.216/030/M/KL/PCR) made by the co-writer Pieter Cretskens from Tecnubel, chapter 9 from pages 36 to 50.

4. Keeping doses ALARA

IRMM made a Hazard Identification and Risk Assessment. According to the IRMM procedure, the form F-0033 was completed and distributed to all IRMM and contractor staff concerned.

Tecnubel also made a risk assessment report: " Veiligheid en Gezondheidsplan".

During the entire project, the ALARA (as low as reasonable achievable) principles were taken into account. The expected dose during the work was low but the major risk was RA contamination. Because all the isotopes were α emitters, internal contamination of staff involved had to be avoided. Also the risk of contaminating the labs, leading to much more secondary waste, was too high.

Special measures:

- **Personal protective equipment** (PPE's): depending on the work: gloves, cut proof gloves, overshoes, full face mask, ventilated suits, Tyvec overalls, ear protection. The correct use was overseen by the radiation protection service of the contractor under supervision of IRMM staff.
- **Radiation protection**: each step of the process was monitored by contamination checks, operators always checked for contamination on hand and foot monitor when leaving tent but still within the lab.
- **Time limits**: only those persons strictly necessary to carry out the work were allowed in the SAS and tent and only for the time needed.
- **Justification**: every manipulation required justification. This means that every step was planned and agreed with the RS and operators.
- **Order and cleanliness**: at the end of each working day, the working area was cleaned and checked for contamination. Whenever possible, materials were shipped out of the controlled area to the buffer storage. Surrounding area and labs were checked daily with a floor contamination monitor.

As a result of all these measures, no contamination was found on the persons involved in the work.
No detectable radiation doses were measured.
No accidents or personal injuries were observed.

These conclusions were confirmed by:
- All the results of the dose meter film badges worn during the whole project were marked as NS (not significant).
- All contractor staff members were asked to collect urine samples after the work. These samples were measured at the neighbouring facilities of the SCK•CEN and no internal contamination was found. Nine persons of NV Tecnubel were involved in the whole project.

5. Waste production

On the basis of cost considerations, different approaches for the packing of combustible and compressible waste were taken.

- Combustible waste must be optimized in relation to its weight.
- Compressible waste must be optimized in relation to its volume.

General way of working

The radiation protection responsible of the contractor was also responsible for the bookkeeping of the waste barrels. He was instructed to keep the same listings as used at IRMM. So for each barrel, two lists were drawn up:

1. one concerning isotopic composition, activity, radiation

Name	*Date*	*Material*	*Isotope*	*Lot No*	*Activity / Dose Rate*

2. the second regarding physico-chemical content including weight

Name	*Date*	*Physico-Chemical Content*	*Weight*

When the dismantling of a glove box was complete, all the documentation was collected and compared with the contamination measurements before dismantling. Together with the contractor waste responsible, the detailed list on each barrel was split up and for every item the activity was calculated. The advantage to the IRMM being that the detailed bookkeeping and the separation of isotopes for each glove box helps avoid the risk of cross-contamination. With these records and findings, the isotopes and the total activity was then calculated for each barrel.

Room	**Glove box**	**Isotope/ Activity Ratio**					
529	H 6	^{234}U / 3%	^{235}U / 10%	^{238}U / 2%	^{237}Np / 60%	^{239}Pu / 25%	
527	H 1	^{239}Pu / 99,2%	^{237}Np/ 0,8 %				
521	H 48	^{241}Am / 68%	^{239}Pu / 32%				
529	H 2	^{239}Pu / 100%					
523	H 21	^{234}U / 1%	^{235}U / 40%	^{238}U / 5%	^{237}Np / 47 %	^{239}Pu / 4%	^{240}Pu / 3%
246	H 101	^{239}Pu / 87%	^{242}Pu / 13%				
	H 102	^{239}Pu / 87%	^{242}Pu / 13%				
	H 73	^{239}Pu / 87%	^{242}Pu / 13%				

Finally, the application forms F – 0006 for waste removal were completed and sent by mail to the IRMM Radwaste Officer, Mr. Fessler. After approval, the documents were signed and the barrels were checked for contamination and moved to the waste building.

5 a. Combustible waste

Glove box	Surface plexi (m^2)	Netto weight combustible waste	Glove rings plexi Yes / No	Factor
H 48	7	86 kg	yes	12,3
H 2	2,54	43 kg	no	17
H 1	6,785	87 kg	no	12,8
H 101,102	5,5	53 kg	yes	9,6
H 73	0,65	32 kg (mixed)	yes	NA
H 21	4,41	52 kg	no	11,8
Average				**12,7**

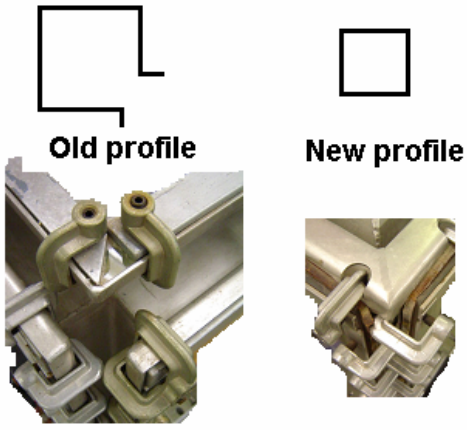
In this table, it can be seen that there is an average relation factor of 12,7 between the surface of plexi glass and the weight of the barrel. The exceptions can be explained by the small size of the glove box, the barrel being filled up with the lighter secondary combustible waste.

This means that the calculation of the surface of the glass gives a very good idea of the anticipated combustible waste.

5 b. Compressible waste

Glove box	Length profiles (m)	Type of profiles	Netto weight compressible waste	Weight/ volume	Factor
H 48	14,4	Old	101 kg	0,505	7
H 2	8	Old	88 kg	0,44	10
H 1	14,2	Old	111 kg	0,555	7,8
H 101, 102	16	New	101 kg	0,505	6,1

Factors and ratios are not extremely different but it can be seen that it is possible to pack more length of profiles for the new type of profile in a barrel of waste. This is because the profiles of the newer type boxes are smaller and easier to pack (rectangle shape) in a compact package then the older types. Since the compressible waste is charged by volume, more waste can be packed in one barrel.
It is very important to calculate the most economic way of packing the barrel before cutting to size.



5 c. Secondary combustible waste

Description Room	Secondary combustible waste	Netto Weight (kg)	Average waste/day (kg)	Days of work	Tent Yes / no
Oven, roller 531	MS04 46 kg	21	2,625	8	no
H 48 Room 521	MS 11 48kg	23	4,6	5	yes
H 2 Room 529					
H 1 Room 527	MS 12 42 kg	17	4,25	4	yes
H101, 102, 73 Room 246	MS 23 45 kg	20	5	4	yes
	MS 03 53 kg	28			
H64, 65 Room 226			5,6	5	yes
H 6 Room 529 H21 Room 523	MS 17 45 kg	46	6,57	7	Yes, and use of glove tent inside
	MS 31 51 kg				

This table shows that the production of combustible waste relates to the Personal Protective Equipment and the time. Weights are gross weight, including 25 kg for an empty barrel. Most of the time, two fully protected workers were in the tent. The contractor responsible participates in the SAS to assist, instruct and take notes and photographs.

- In a demarcated area, the average combustible waste was **2,62 kg/day**
- In a tent with protective clothing with air supply, the average was **4,86 kg/day**
- In the tent with the "glove tent" inside, the average was **6,57 kg/day**

Therefore the most economic way of dismantling is inside a demarcated area. This is only suitable for small contaminated objects (<1 Bq/cm²).
Since the IRMM has a zero tolerance regarding contamination, the wearing of less protective clothing was not an option.

5 d. Comparing estimated/final waste production

In the frame of the tender procedure, an **estimate** of the waste barrels had to be presented in order to allow IRMM to compare the bids. Now that the dismantling is completed, it is useful to compare the final waste quantities with the estimates presented in the tender.

Description	Barrels		Mass(kg)		Category	
	Estim.	Final	Estim.	Final	Estim.	Final
Room 226 H 64, 65	0,5	0,5	15	14	A11	A11
	0,5	2	75	179	A17	A17
Roller, oven	1	1	30	21	A11	A11
Room 521 H48	1,5	2,5	45	97	A11	A11
	0,3	1	40	101	A17	A17
	0,1	1	15	102	A21	SPE-A17
Room 529 H2	1	1,5	30	55	A11	A11
	0,15	1	20	88	A17	A17
	0,05	-	7	-	A27	-
Room 529 H6	2	2	60	148	A11	SPE-A27
	0,5	1	40	60	A27	A27
Room 523 H21	3	5	90	167	A11	A21
	1	3	80	223	A27	A27
Room 527 H1	1,5	2	45	74	A11	A11
	0,3	2	40	201	A17	A17
	0,1	1	15	107	A27	A14

Total barrels		Total mass(kg)		Waste category
Estim.	Final	Estim.	Final	
10	7,5	315	261	A11 - combustible, non alpha
-	5	-	167	A21 - combustible, alpha suspected
-	1	-	107	A14 - non compressible, non alpha
2	6	175	569	A17 - compressible, non alpha
2	4	160	283	A27 - compressible, alpha suspected
-	3	-	250	SPE - more then 10% Al
14	**26,5**			

- Combustible waste was estimated at 10 barrels and resulted in 12,5 barrels.
- One barrel non compressible was not foreseen but dismantling pump H 1 was carried out during the campaign.
- The largest under-estimation is the compressible waste. The contractor made an estimate based on decontamination of compressible parts. But during the preparation phase IRMM decided to fix the contamination in the glove boxes in order to minimise the risk of dust spreading during the dismantling. Decontamination was made impossible. Additionally, tools and electric machinery were also shipped as waste.
- Past experience has shown that the decontamination of old glove boxes was not very successful. This can also create a lot of secondary waste. It can be expected that the total number of waste barrels created will not be less.

6. Final conclusions

On several points, this project was a very good experience to study new dismantling techniques and decommissioning work.
In terms of the ALARA principle, it was a very successful project.
In the future, it will be an obligation to limit possible waste and waste cost as much as possible when building new installations.

6 a. Dismantling

The fact that a zero tolerance regarding contamination was always pursued led to the decommissioning of almost all the infrastructure that wasn't specifically used for work with radioactive materials. This was demonstrated well in this exercise as less than 2 weight% was shipped as RA waste. Therefore in future projects it can be expected to decommission the entire infrastructure: furniture, cupboards, tables, tools, etc.

On the other hand, the part of the equipment used for working with radioactive materials was fully dismantled and packed as radioactive waste. Other lessons can also be learned from the exercise:

- **Combustible** waste is paid by weight. The weight to be expected can be calculated in relation to the plexi-glass surface as described in point 4a.
- **Compressible** waste of the glove boxes depends on the profiles used in the construction as described in point 4b and the exact way of cutting larger surfaces. Since this waste is paid by volume, it is important to pack as much as possible in one barrel.
- **Secondary combustible waste** depends on the chosen level of protection. But combustible waste is the less expensive waste, so personal safety must always have priority to waste cost. If the use of less PPE means can be proven in advance, only then can this be considered as an option.

6 b. Time spent by I.R.M.M. staff

	Melis Gustaaf **Radiation Protection Officer** **I.R.M.M. (hours)**	**Dalemans Theo** **Radiation Protection** **E.C.S. (hours)**
Before Campaign	66	34
During Campaign	92	299
After Campaign	84	18
Total	**242**	**351**

6 c. Reduction of future R.A. waste

- Any new glove boxes to be installed should be made, whenever possible, completely out of plexi-glass. This is now already done for the last few years. The weight of the different parts of the new boxes should be recorded in order to allow a better forecast of future decommissioning costs.
- If the equipment inside a glove box necessitates a more robust structure and iron profiles must be used, the choice must be the new rectangular types of tubes. When dismantling, one can pack more length of tubes in the same volume.
- To limit secondary waste, as many objects as possible should be done in one demarcated area, tent or glove tent. The contamination checks needed before a project starts are extremely important. The contamination level and isotope determines the use of personal protective equipment and eventually the production of secondary waste.

Annex: gross weight and numbers of waste barrels

Description Room	**Barrels filled before campaign**	**Dismantling**			**Secondary combustible waste**
		Combustible	**Compressible**	**Non - compressible**	
H64, 65 Room 226	03/063 compressible 63 kg		MS 01 113 kg		See 246 *
	04/086 combustible 46 kg		MS 02 116 kg		
Oven, roller 531					MS04 46 kg
H 48 Room 521	03/066 compressible 150 kg	MS 07 61 kg	MS 06 126 kg		
	04/093 combustible 52 kg	MS 05 75 kg	MS09 (H48, H2) 127 kg		MS 11 48kg
H 2 Room 529		MS 10 68 kg			
			MS 08 113 kg		
H 1 Room 527		MS 16 82 kg	MS 13 136 kg	MS 014 107 kg	MS 12 42 kg
H101, 102, 73 Room 246		MS 19 57 kg	MS 18 93 kg		MS 23 45 kg
		MS 21 78 kg	MS 20 135 kg		MS 03 53 kg (partly 226)*
			MS 22 115 kg		
H 6 Room 529 H21 Room 523		MS 25 77 kg	MS 15 (H 1, H21) 113kg		MS 17 45 kg
		MS 29 51 kg	MS 24 92 kg		MS 31 51 kg
		MS 30 68 kg	MS 26 85 kg		
			MS 27 87 kg	**Special waste (more then 10% aluminium)**	
			MS 28 119 kg		

European Commission

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Abstract

At the Institute for Reference Materials and Measurements (IRMM) a dismantling campaign of obsolete installations and glove boxes has been runned in 2005.

The main goal was to create as less waste as possible by extensive contamination checks and by decontaminating if necessary. For the glove boxes, decontamination was not possible. Here it was necessary to document all the stages of the dismantling process.

The purpose of the report is to learn from the experiences of this campaign which gave the ability to make estimates of future radioactive waste or classic waste that could be expected from dismantled installations.

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